

## WHAT IS CLAIMED IS:

1           1. For use in a base station (BS) of a fixed wireless  
2 network capable of communicating with a plurality of subscriber  
3 transceivers via time division duplex (TDD) channels, a BS  
4 transceiver comprising:

5           a receiver front-end capable of receiving data burst  
6 transmissions from said plurality of subscriber transceivers in an  
7 uplink portion of a TDD channel, wherein said receiver front-end  
8 demodulates said received data burst transmissions into a digital  
9 baseband signal in-phase (I) signal and a digital baseband  
10 quadrature (Q) signal;

11           a first frequency domain feedforward equalization filter  
12 capable of receiving said I signal and performing a Fast Fourier  
13 Transform on a block of N symbols in said I signal to produce a  
14 first symbol estimate sequence;

15           a second frequency domain feedforward equalization filter  
16 capable of receiving said Q signal and performing a Fast Fourier  
17 Transform on a block of N symbols in said Q signal to produce a  
18 second symbol estimate sequence;

19           an adder capable of receiving said first signal estimate  
20 sequence on a first input and said second signal estimate sequence  
21 on a second input and producing a combined symbol estimate  
22 sequence;

23 a slicer capable of receiving and quantizing said  
24 combined symbol estimate sequence to produce a sequence of decided  
25 symbols; and

26 a time domain feedback filter capable of receiving said  
27 sequence of decided symbols and generating a symbol correction  
28 sequence that is applied to a third input of said adder.

1 2. The BS transceiver as set forth in Claim 1 wherein said  
2 first frequency domain feedforward equalization filter is  $2/T$   
3 fractionally spaced, where  $T$  is a period of said block of said  $N$   
4 symbols.

1 3. The BS transceiver as set forth in Claim 2 wherein said  
2 second frequency domain feedforward equalization filter is  $2/T$   
3 fractionally spaced, where  $T$  is a period of said block of said  $N$   
4 symbols.

1 4. The BS transceiver as set forth in Claim 1 wherein said  
2 time domain feedback filter comprises a delay line comprising  $D$   
3 delay taps.

1           5.    The BS transceiver as set forth in Claim 4 wherein said  
2   time domain feedback filter uses C feedback coefficients to  
3   generate said symbol correction sequence, where C is less than D.

1           6.    The BS transceiver as set forth in Claim 5 wherein said  
2   feedback filter is a RAKE filter.

1           7.    The BS transceiver as set forth in Claim 1 further  
2   comprising a channel estimation circuit capable of detecting a  
3   preamble sequence of symbols in at least one of said I and Q  
4   signals and producing therefrom a first plurality of feedforward  
5   coefficients usable by said first frequency domain feedforward  
6   equalization filter.

1           8.    The receiver as set forth in Claim 7 wherein said channel  
2   estimation circuit produces a second plurality of feedforward  
3   coefficients usable by said first frequency domain feedforward  
4   equalization filter.

1           9.    The receiver as set forth in Claim 1 wherein  $N=16$ .

10. A fixed wireless network comprising:

a plurality of base stations capable of communicating with a plurality of subscriber transceivers via time division duplex (TDD) channels, each said base station having a base station (BS) transceiver comprising:

a receiver front-end capable of receiving data burst transmissions from said plurality of subscriber transceivers in an uplink portion of a TDD channel, wherein said receiver front-end demodulates said received data burst transmissions into a digital baseband signal in-phase (I) signal and a digital baseband quadrature (Q) signal;

a first frequency domain feedforward equalization filter capable of receiving said I signal and performing a Fast Fourier Transform on a block of N symbols in said I signal to produce a first symbol estimate sequence;

a second frequency domain feedforward equalization filter capable of receiving said Q signal and performing a Fast Fourier Transform on a block of N symbols in said Q signal to produce a second symbol estimate sequence;

an adder capable of receiving said first signal estimate sequence on a first input and said second signal estimate sequence on a second input and producing a combined symbol estimate sequence;

24 a slicer capable of receiving and quantizing said  
25 combined symbol estimate sequence to produce a sequence of  
26 decided symbols; and

27 a time domain feedback filter capable of receiving  
28 said sequence of decided symbols and generating a symbol  
29 correction sequence that is applied to a third input of said  
30 adder.

1 11. The fixed wireless network as set forth in Claim 10  
2 wherein said first frequency domain feedforward equalization filter  
3 is  $2/T$  fractionally spaced, where  $T$  is a period of said block of  
4 said  $N$  symbols.

1 12. The fixed wireless network as set forth in Claim 11  
2 wherein said second frequency domain feedforward equalization  
3 filter is  $2/T$  fractionally spaced, where  $T$  is a period of said  
4 block of said  $N$  symbols.

1 13. The fixed wireless network as set forth in Claim 10  
2 wherein said time domain feedback filter comprises a delay line  
3 comprising  $D$  delay taps.

1 14. The fixed wireless network as set forth in Claim 13  
2 wherein said time domain feedback filter uses C feedback  
3 coefficients to generate said symbol correction sequence, where C  
4 is less than D.

1 15. The fixed wireless network as set forth in Claim 14  
2 wherein said feedback filter is a RAKE filter.

1 16. The fixed wireless network as set forth in Claim 10  
2 further comprising a channel estimation circuit capable of  
3 detecting a preamble sequence of symbols in at least one of said I  
4 and Q signals and producing therefrom a first plurality of  
5 feedforward coefficients usable by said first frequency domain  
6 feedforward equalization filter.

1 17. The fixed wireless network as set forth in Claim 16  
2 wherein said channel estimation circuit produces a second plurality  
3 of feedforward coefficients usable by said first frequency domain  
4 feedforward equalization filter.

1           18. The fixed wireless network as set forth in Claim 10  
2 wherein  $N=16$ .